

WHAT IS CLAIMED IS:

1. An image reading method in which a film having images recorded in a plurality of frames in a longitudinal direction is transported to read the images in said plurality of frames photoelectrically at an image reading position by an image reading device, comprising the steps of:

transporting said film in a first direction along a read and transport path including said image reading position to perform a first image reading for reading the images in said plurality of frames by said image reading device;

returning a forward end of said film to said read and transport path on an entry or exit side of said read and transport path after said first image reading has been finished; and

transporting said film along said read and transport path in said first direction or in a second direction opposite to said first direction to perform a second image reading in which the images in said plurality of frames are read by said image reading device at said image reading position in a sequence of frames that was applied to said first image reading.

2. The image reading method according to claim 1, wherein said first image reading is a prescan for reading the images in said plurality of frames of said film with low resolution, and said second image reading is a fine scan for reading the images in said plurality of frames of said film with high resolution.

3. The image reading method according to claim 1, wherein said first image reading is performed for determining a frame position of each of the images in said plurality of frames and reading conditions for said second image reading.

4. The image reading method according to claim 1, wherein said first image reading is performed for determining image processing conditions.

5. The image reading method according to claim 1, wherein said second image reading is performed for obtaining output image data.

6. The image reading method according to claim 1, wherein, after said first image reading has been finished,

the forward end of said film is held at a specified position and said film is temporarily reserved in a specified space and wherein said film is returned to said read and transport path on the entry or exit side of said read and transport path after all of the images in said plurality of frames of said film have been subjected to said first image reading.

7. The image reading method according to claim 1, wherein said film is transported along a loop-shaped transport path so that the forward end of said film after said first image reading has been finished can be returned to said read and transport path on the entry or exit side of said read and transport path.

8. The image reading method according to claim 1, wherein the forward end of said film after said first image reading has been finished is returned to said read and transport path on the exit side of said read and transport path and wherein said film is transported along said read and transport path in said second direction to be subjected to said second image reading.

9. The image reading method according to claim 8,

wherein, in said second image reading, the images in said plurality of frames of said film are read from a film surface opposite to that subjected to said first image reading.

10. The image reading method according to claim 8, wherein the forward end of said film after said first image reading has been finished is returned to said read and transport path on the exit side of said read and transport path after film surfaces have been reversed to each other and wherein, in said second image reading, the images in said plurality of frames of said film are read from a film surface identical to that subjected to said first image reading.

11. The image reading method according to claim 8, wherein at least one of first image data obtained by said first image reading and second image data obtained by said second image reading is subjected to at least one processing of two-face inversion processing and one-face inversion processing when it is necessary to perform said at least one processing on a film surface captured in each of the first image reading and the second image reading.

12. The image reading method according to claim 8, wherein from which surface side said film was read is detected in at least one of said first image reading and said second image reading and wherein, depending on which surface side was detected, it is determined whether or not at least one of first image data and second image data obtained by said first image reading and said second image reading, respectively requires each of two-face inversion processing and one-face inversion processing such that at least one processing of said two-face inversion processing and said one-face inversion processing can be performed when said at least one processing is necessary.

13. The image reading method according to claim 11, wherein said first image data is not subjected to said two-face inversion processing or said one-face inversion processing and wherein image processing conditions determined based on said first image data include information as to whether or not each of said two-face inversion processing and said one-face inversion processing is necessary so that said second image data can be subjected to the at least one processing of said two-face inversion processing and said one-face inversion processing based on the image processing conditions when said at least

one processing is necessary..

14. The image reading method according to claim 12, wherein a bar code recorded in the film is extracted to acquire bar code information thereby detecting from which surface side the film was read.

15. The image reading method according to claim 1, wherein the forward end of said film after said first image reading has been finished is returned to said read and transport path on the entry side of said read and transport path and wherein, in said second image reading, said film is transported along said read and transport path in said first direction and is read from a film surface identical to that subjected to said first image reading.

16. The image reading method according to claim 15, wherein said film is transported along a loop-shaped transport path so that the forward end of said film after said first image reading has been finished can be returned to said read and transport path on the entry side of said read and transport path.

17. The image reading method according to claim 16,

wherein an optical path of projected light that reaches said image reading device from an illuminant for exposing said film is formed not so as to cross over said loop-shaped transport path when said film is photoelectrically read by said image reading device.

18. The image reading method according to claim 17, wherein the optical path of said projected light is changed in direction in mid course between said illuminant and said film.

19. The image reading method according to claim 17, wherein the optical path of said projected light is changed in direction in mid course between said film and said image reading device.

20. The image reading method according to claim 17, wherein the optical path of said projected light is straight.

21. The image reading method according to claim 20, wherein said loop-shaped transport path is formed so that said film can be twisted in mid course not to cross over the optical path of said projected light.

22. The image reading method according to claim 1, wherein, in said first image reading, said first image reading is performed and in parallel, a plurality of conditions including a frame position of each of the images in said plurality of frames, reading conditions for said second image reading and image processing conditions are corrected or determined, and wherein in correcting or determining the plurality of conditions, the plurality of conditions are not only corrected or determined but also said second image reading is performed in parallel based on the reading conditions for said second image reading that have been already determined.